

STATE OF NEVADA

Department of Conservation & Natural Resources

DIVISION OF ENVIRONMENTAL PROTECTION

Kenny C. Guinn, Governor

Allen Biaggi, Director

Leo M. Drozdoff, P.E., Administrator

Digital to: SMC et al

JUN 26 2006

June 13, 2006

Ms. Susan Crowley
Tronox LLC
PO Box 55
Henderson, Nevada 89009

Re: **Tronox LLC (Trx)**
NDEP Facility ID #H-000539

Nevada Division of Environmental Protection requested format and content changes to Semi-Annual Chromium Performance Reports and Quarterly Perchlorate Performance Reports

Dear Ms. Crowley,

The NDEP has reviewed the format and content of the reports that are generated to evaluate the performance of the chromium and perchlorate remedial systems. Since these systems are inherently linked, it is the opinion of the NDEP that a single report should be generated. This will reduce duplication of efforts by Trx and the NDEP. Additionally, in the future, as additional analytes are added it is logical to discuss all of these matters under a single report. This is consistent with the methodology applied at other sites. Detailed comments are included as Attachment A to this letter.

It is suggested that a meeting be scheduled to discuss these comments and the schedule for implementation of the revised format and content.

Please contact me if there are any questions.

Sincerely,

Brian A. Rakvica, P.E.
Supervisor, Special Projects Branch
Bureau of Corrective Actions
NDEP-Las Vegas Office



Ms. Susan Crowley

June 13, 2006

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CC: Jim Najima, NDEP, BCA, Carson City
Shannon Harbour, NDEP, BCA, Las Vegas
Todd Croft, NDEP, BCA, Las Vegas
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Washington, D.C. 20036
Brenda Pohlmann, City of Henderson, PO Box 95050, Henderson, NV 89009
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Craig Wilkinson, TIMET, PO Box 2128, Henderson, Nevada, 89009-7003
Kirk Stowers, Broadbent & Associates, 8 West Pacific Avenue, Henderson, Nevada 89015
George Crouse, Syngenta Crop Protection, Inc., 410 Swing Road, Greensboro, NC 27409
Lee Erickson, Stauffer Management Company, 400 Ridge Rd., Golden, CO 80403
Chris Sylvia, Pioneer Americas LLC, PO Box 86, Henderson, Nevada 89009
Paul Sundberg, Montrose Chemical Corporation, 3846 Estate Drive, Stockton, California
95209
Joe Kelly, Montrose Chemical Corporation of CA, 600 Ericksen Avenue NE, Suite 380,
Bainbridge Island, WA 98110

Attachment A

1. General comment, the quarterly and semi-annual groundwater monitoring reports generated by TIMET are an acceptable format and Trx should consider reviewing the general formatting of these reports in addition to the comments provided below.
2. General comment, the NDEP acknowledges and appreciates that some of these changes may necessitate a change in existing consent orders, consent agreements and administrative orders on consent.
3. The goals of the report are as follows:
 - a. Demonstrate capture (hydrologic and chemical);
 - b. Demonstrate system removal efficiency; and
 - c. Presentation of contamination extents (e.g.: plume maps).
4. The NDEP suggests that the frequency of the report be as follows:
 - a. Quarterly reporting and sampling for a limited number of wells.
 - b. Annual reporting for the larger set of wells.
 - c. Full contour maps presented quarterly with dashed contours for inclusion of non-contemporaneous data.
5. The NDEP has the following suggestions for the text of the report:
 - a. The format as laid out in the semi-annual chromium report, which is virtually identical to the quarterly perchlorate report, is acceptable to the NDEP with exceptions noted below.
 - b. Please add a discussion of the layout of the system. This discussion should be tied to a new figure which is a process flow diagram (PFD). This PFD should detail the entire system including (but not limited to):
 - i. Well fields/surface water capture
 - ii. Lift stations
 - iii. Discharge pipe
 - iv. Treatment systems
 - v. Pond GW-11 and any other storage units
 - c. Within the discussion of each well field, Trx should discuss any findings that are out of the ordinary. If the findings are consistent with previous quarters very little discussion is needed.
 - d. The chromium report contains very little discussion regarding hexavalent chromium. The NDEP requests that this discussion be greatly expanded. It is the understanding of the NDEP that the plume is nearly 100% hexavalent. Trx should sample the entire plume for hexavalent and total chromium to determine this. Due to the toxicity of hexavalent chromium, future reporting should discuss this issue.
6. General comment, database and report development, the NDEP has the following comments:
 - a. It is not evident to the NDEP that Trx utilizes a database and appropriate GIS/mapping software to develop these reports.
 - b. It is the opinion of the NDEP that development of a comprehensive, validated database (MS Access compatible) and utilization of GIS/mapping software will eventually expedite the development of these reports. Furthermore, this electronic relationship will correct some of the

- quality problems that have been noted between figure and table development. The NDEP can provide examples, if necessary.
- c. In addition, a long-term cost savings is likely to be realized.
 - d. The NDEP acknowledges that there is a cost associated with the development of this database that will likely take several months and tens of thousands of dollars.
7. Figures, the NDEP has the following suggestions and comments:
- a. If Trx believes that the development of these figures on a quarterly basis is too onerous, the NDEP is willing to discuss inclusion of some of these figures on a semi-annual or annual basis only.
 - b. Figure 1, location map, generally acceptable.
 - c. Presentation of consent order monitoring area, the NDEP believes that this figure is generally unnecessary and can be incorporated into other figures.
 - d. Consent Order Area potentiometric surface, the NDEP does not find this figure useful and requests that this figure be replaced with a new figure that covers a larger area. Trx has developed figures at a scale of 1"=1,000' and these are useful (similar to the "annual figures" submitted for perchlorate).
 - e. Contaminant maps for on-site, the NDEP does not find this figure useful and prefers a map that covers a larger area. Trx has previously developed figures at a scale of 1"=1,000' and these are useful (similar to the "annual figures" submitted for perchlorate).
 - f. Cross-sections, the NDEP finds these figures useful. The NDEP requests that the reports contain one of these figures for each well field. A figure similar to Plate 5 of the quarterly perchlorate report is useful. The NDEP requests that the lithologic data be added to this figure.
 - g. Time versus concentration graphs, the NDEP believes that these figures are useful and suggests that the figures that are presented as a "section graph" be used. It is requested that one of these figures be included for each well field transect for the following contaminants: perchlorate, TDS, hexavalent chromium and total chromium.
8. Tables, the NDEP has the following suggestions and comments:
- a. Select wells data tables, the following is suggested:
 - i. The tables that are presented should show all wells and all analytes. These tables can be time limited (e.g.: the last five quarters of data).
 - ii. The electronic version of the tables should include all current and historical data.
 - iii. In these tables, the consent agreement wells can be flagged in some sort of way.
 - b. Influent and effluent concentrations, this is a helpful table.
 - c. Present discharge pumping rates for each well in each well field.
 - d. Ground water elevation data. It is suggested that this information be presented for all wells versus time in an Appendix. A select number of hydrographs can present this data in the "Figures" section.
9. Miscellaneous

Ms. Susan Crowley

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- a. The sampling method(s) used needs to be clarified. This is one of many items that needs to be included in the Field Sampling Plan (FSP) as a Standard Operating Procedure (SOP).
- b. Bailing is not an acceptable method of sampling.
- c. Tronox is strongly encouraged to evaluate the applicability of low flow purge and sampling.

Tronox Response to NDEP June 13, 2006 Comments on content and format of Chromium and Perchlorate Reports

NDEP Comment:

1. General comment, the quarterly and semi-annual groundwater monitoring reports generated by TIMET are an acceptable format and Trx should consider reviewing the general formatting of these reports in addition to the comments provided below.

Response:

Tronox has considered the TIMET format and will use a combination of the TIMET format and the current Tronox format for future reports.

NDEP Comment:

2. General comment, the NDEP acknowledges and appreciates that some of these changes may necessitate a change in existing consent orders, consent agreements and administrative orders on consent.

Response:

Some of these changes will necessitate a change in existing consent orders, consent agreements and administrative orders on consent. Tronox is working to complete needed changes.

NDEP Comment:

3. The goals of the report are as follows:
 - a. Demonstrate capture (hydrologic and chemical);
 - b. Demonstrate system removal efficiency; and
 - c. Presentation of contamination extents (e.g.: plume maps).

Response:

The report will address the goals of hydrologic and chemical capture, system removal efficiency and limits of contamination.

NDEP Comment:

4. The NDEP suggests that the frequency of the report be as follows:
 - a. Quarterly reporting and sampling for a limited number of wells.
 - b. Annual reporting for the larger set of wells.
 - c. Full contour maps presented quarterly with dashed contours for inclusion of non-contemporaneous data.

Response:

The frequency of reports will be a quarterly perchlorate report using a limited number of "key" wells and an annual report using a larger set of wells. The list of "key" wells will be developed in the near future. Full contour maps will be presented semi-annually with dashed contours for inclusion of non-contemporaneous data.

NDEP Comment:

5. The NDEP has the following suggestions for the text of the report:
 - a. The format as laid out in the semi-annual chromium report, which is virtually identical to the quarterly perchlorate report, is acceptable to the NDEP with exceptions noted below.

- b. Please add a discussion of the layout of the system. This discussion should be tied to a new figure which is a process flow diagram (PFD). This PFD should detail the entire system including (but not limited to):
 - i. Well fields/surface water capture
 - ii. Lift stations
 - iii. Discharge pipe
 - iv. Treatment systems
 - v. Pond GW-11 and any other storage units
- c. Within the discussion of each well field, Trx should discuss any findings that are out of the ordinary. If the findings are consistent with previous quarters very little discussion is needed.
- d. The chromium report contains very little discussion regarding hexavalent chromium. The NDEP requests that this discussion be greatly expanded. It is the understanding of the NDEP that the plume is nearly 100% hexavalent. Trx should sample the entire plume for hexavalent and total chromium to determine this. Due to the toxicity of hexavalent chromium, future reporting should discuss this issue.

Response:

- a. *Tronox notes that the chromium and perchlorate report format is acceptable to the NDEP with some exceptions.*
- b. *A Process Flow Diagram is included in the combined report. A discussion of the system will be included.*
- c. *Tronox will discuss any findings that are out of the ordinary in the combined report.*
- d. *Tronox assumes that the entire plume is hexavalent chromium but maintains that analyses of total chromium captures the hexavalent component and is much less expensive to run than hexavalent chromium analyses.*

NDEP Comment:

6. General comment, database and report development, the NDEP has the following comments:
 - a. It is not evident to the NDEP that Trx utilizes a database and appropriate GIS/mapping software to develop these reports.
 - b. It is the opinion of the NDEP that development of a (MS Access compatible) and utilization of GIS/mapping software will eventually expedite the development of these reports. Furthermore, this electronic relationship will correct some of the quality problems that have been noted between figure and table development. The NDEP can provide examples, if necessary.
 - c. In addition, a long-term cost savings is likely to be realized.
 - d. The NDEP acknowledges that there is a cost associated with the development of this database that will likely take several months and tens of thousands of dollars.

Response:

- a. *Tronox utilizes EQUIS database to develop these reports. Hand contouring of maps is considered to be superior to the use of mapping software and will continue to be employed in constructing the report maps.*
- b. *Tronox already uses EQUIS database which is a comprehensive, validated database.*
- c. *Long-term cost savings may or may not be realized.*
- d. *Tronox already employs a comprehensive, validated database.*

NDEP Comment:

7. Figures, the NDEP has the following suggestions and comments:

- a. If Trx believes that the development of these figures on a quarterly basis is too onerous, the NDEP is willing to discuss inclusion of some of these figures on a semi-annual or annual basis only.
- b. Figure 1, location map, generally acceptable.
- c. Presentation of consent order monitoring area, the NDEP believes that this figure is generally unnecessary and can be incorporated into other figures.
- d. Consent Order Area potentiometric surface, the NDEP does not find this figure useful and requests that this figure be replaced with a new figure that covers a larger area. Trx has developed figures at a scale of 1"=1,000' and these are useful (similar to the "annual figures" submitted for perchlorate).
- e. Contaminant maps for on-site, the NDEP does not find this figure useful and prefers a map that covers a larger area. Trx has previously developed figures at a scale of 1"=1,000' and these are useful (similar to the "annual figures" submitted for perchlorate).
- f. Cross-sections, the NDEP finds these figures useful. The NDEP requests that the reports contain one of these figures for each well field. A figure similar to Plate 5 of the quarterly perchlorate report is useful. The NDEP requests that the lithologic data be added to this figure.
- g. Time versus concentration graphs, the NDEP believes that these figures are useful and suggests that the figures that are presented as a "section graph" be used. It is requested that one of these figures be included for each well field transect for the following contaminants: perchlorate, TDS, hexavalent chromium and total chromium.

Response:

- a. *A complete set of figures will be included in the annual combined report. Figures in the other groundwater reports will be scaled back.*
- b. *Tronox will continue to use an updated Location Map.*
- c. *Consent order monitoring area map has been eliminated.*
- d. *Consent Order Area potentiometric surface map has been combined into an area-wide 1" = 500' map.*
- e. *On-site contaminant maps have been combined into area-wide 1" = 500' maps.*
- f. *Cross-sections will be presented for each well field. Lithologic data will be added to these figures.*
- g. *Time versus concentration graphs (Trend Graphs) will be included for each well field. Trend graphs will be included for perchlorate and total chromium. When at least 5 data points are available for TDS, trend graphs of TDS will also be included.*

NDEP Comment:

8. Tables, the NDEP has the following suggestions and comments:
 - a. Select wells data tables, the following is suggested:
 - i. The tables that are presented should show all wells and all analytes. These tables can be time limited (e.g.: the last five quarters of data).
 - ii. The electronic version of the tables should include all current and historical data.
 - iii. In these tables, the consent agreement wells can be flagged in some sort of way.
 - b. Influent and effluent concentrations, this is a helpful table.
 - c. Present discharge pumping rates for each well in each well field.
 - d. Ground water elevation data. It is suggested that this information be presented for all wells versus time in an Appendix. A select number of hydrographs can present this data in the "Figures" section.

Response:

- a. The combined report will contain tables that show all wells and all analytes. The electronic version of the tables will include all current and historic data. The consent agreement wells will be flagged.*
- b. Influent and effluent tables will be included.*
- c. Discharge pumping rate tables for each well field will be included.*
- d. Ground water elevation data tables will be included. A select number of hydrographs will be included.*

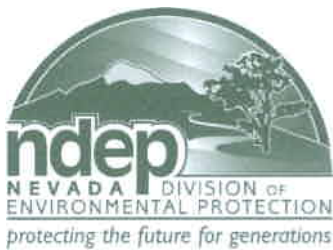
NDEP Comment:

9. Miscellaneous

- a. The sampling method(s) used needs to be clarified. This is one of many items that needs to be included in the Field Sampling Plan (FSP) as a Standard Operating Procedure (SOP).
- b. Bailing is not an acceptable method of sampling.
- c. Tronox is strongly encouraged to evaluate the applicability of low flow purge and sampling.

Response:

- a. The sampling methods will be clarified in the future FSP and SOP.*
- b. Bailing will continue to be used due to the extreme expense in time and materials associated with low flow purge of over 200 sampled wells. The Upgradient Results Report contains a site specific comparison and evaluation of low-flow to bailing sampling methods and analytical results.*
- c. Low flow purge is not cost effective in sampling over 200 wells for the sampling events.*



STATE OF NEVADA

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DIVISION OF ENVIRONMENTAL PROTECTION

Kenny C. Guinn, Governor

Allen Biaggi, Director

Leo M. Drozdoff, P.E., Administrator

Digital to SMCrowley

SEP - 1 2006

August 29, 2005

Ms. Susan Crowley
Tronox LLC
PO Box 55
Henderson, Nevada 89009

Re: **Tronox LLC (TRX)**
NDEP Facility ID #H-000539
Nevada Division of Environmental Protection Response to:
Semi-Annual Performance Report – Chromium Mitigation Program
dated July 25, 2006

Dear Ms. Crowley,

The NDEP has received and reviewed Tronox's report identified above and provides comments below.

1. General comment, it is the expectation of the NDEP that many of the issues regarding format and content of future versions of this report will be discussed with Trx during a meeting that is expected to be held during September. Generally, these comments will not be presented herein.
2. General comment, regarding TRX conclusions regarding the effectiveness of the capture system, the NDEP does not concur with TRX's conclusions. It is the belief of the NDEP that TRX has never quantitatively demonstrated the effectiveness of the capture system. One specific comment is that the NDEP does not concur that capture is being achieved on the eastern portion of the plume. The NDEP will not provide additional detailed comments at this time.
3. Potential Onsite Interim Remediation, page 6, it would seem that groundwater pumped from wells M-70, M-71 and M-72 could be treated with ferrous sulfate, calcium polysulfide or another suitable amendment relatively easily. Please discuss TRX's anticipated timeframe for evaluation of this interim remedial measure (IRM).
4. Conclusions, page 8, the NDEP would like additional detail regarding the proposed timeframe to evaluate the implementation of additional measures to the west side of the chromium plume.
5. Plate 2, the NDEP does not fully concur with the contours presented by TRX. In general, TRX lacks sufficient control to present contours as solid lines in several areas. Specifically, the NDEP does not concur that the 0.05 mg/liter contour between Athens



Road and the Las Vegas Wash is discontinuous. Additionally, if a contour map was developed for hexavalent chromium the NDEP would be interested in additional contours at the 0.01 mg/liter and 0.005 mg/liter levels. Additionally, paleochannel locations may influence groundwater flow; however, they are not the only means of contaminant transport in the sub-surface. For example, it appears that the 0.05 mg/liter contour could be drawn between wells PC93/94, PC58, PC1, and PC2. It is unclear if this contour could be extended to the south to the vicinity of wells ARP-5, ARP-6 and further south.

6. Appendix E, the NDEP has the following comments:

Level of Data Validation. The memorandum states, "A limited review was performed on the data for the analyses of raw groundwater samples, raw surface waters, one equipment blank, and two field blanks for one or both of the parameters listed below:

- Hexavalent chromium by SW-846 Method 7196
- Total chromium by EPA 200.7

The NDEP letter, dated May 3, 2006, indicates data validation is to include 100% review and at least 10% validation to the raw data level. The details for each level of review are further specified in that letter. The level of review indicated in the memorandum does not meet the NDEP requirements.

Missing elements of the review include:

- Random check (10-20%) of Initial and Continuing Calibration.
- Random recalculation (10-20%) of reported results versus raw data.

If the level of laboratory reporting does not support a validation at Tier 2 this should be stated in the report.

Level of Reporting. The following items are missing in the Memorandum report. These items are required per the NDEP letter dated May 3, 2006. Many of these items can be addressed by including tables that contained the required information. Also, when accuracy, precision and holding time data is included, the table should also contain the applicable data quality indicator. Examples of data quality indicators include the percent recovery, RPD, time of collection to extraction and/or analysis.

- Applicable Samples, SDG ID, sample ID link to sample location, analyses.
- Data validation qualifier definition. When possible, the use of qualifiers be added to the tables, and used when appropriate, to identify a potential direction of a bias. For example, when the spike data show low recovery, and the associated samples and analytes are detected, a "J-" qualifier should be used to indicate an estimated, and potentially biased low, result. Similarly, a "J+" qualifier would be used for recoveries that are greater than the recovery criteria.
- Definitions for the reason codes that link results in the database to a specific qualifier logic.
- Data validation findings for each parameter based on the level of review. When non-conformances are identified they should be linked to the appropriate sample(s) and SDG.
- Evaluation of PARCCS parameters.

Ms. Susan Crowley

8/29/2006

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- Conclusions/Recommendations.
- Electronic database of the dataset that is being addressed by the report including all raw data and laboratory report (on CD in Microsoft Access database).

It is recommended that TRX's chemists discuss this matter with the NDEP's chemists before proceeding with any further data validation.

If there are any questions please do not hesitate to contact me.

Sincerely,



Brian A. Rakvica, P.E.
Supervisor
Bureau of Corrective Actions
Special Projects Branch
NDEP-Las Vegas Office

CC: Jim Najima, NDEP, BCA, Carson City
Jeff Johnson, NDEP, BCA, Carson City
Shannon Harbour, NDEP, BCA, Las Vegas
Todd Croft, NDEP, BCA, Las Vegas
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Mitch Kaplan, U.S. Environmental Protection Agency, Region 9, mail code: WST-5,
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Joe Kelly, Montrose Chemical Corporation of CA, 600 Ericksen Avenue NE, Suite 380,
Bainbridge Island, WA 98110
David Gratson, Neptune and Company, 1505 15th Street, Suite B, Los Alamos, NM 87544

**Tronox Response to NDEP August 29, 2006 Comments on Chromium Semiannual Report
Dated July 25, 2006**

NDEP Comment:

1. General comment, it is the expectation of the NDEP that many of the issues regarding format and content of future versions of this report will be discussed with Trx during a meeting that is expected to be held during September. Generally, these comments will not be presented herein.

Response:

The meeting was held on September 14th and NDEP and TRX resolved several issues relating to quarterly well sampling, annual reporting and performance monitoring. Specific issues detailed in NDEP's June 13 and August 29, 2006 comment letters will be addressed on a comment by comment basis by TRX.

NDEP Comment:

2. General comment, regarding TRX conclusions regarding the effectiveness of the capture system, the NDEP does not concur with TRX's conclusions. It is the belief of the NDEP that TRX has never quantitatively demonstrated the effectiveness of the capture system. One specific comment is that the NDEP does not concur that capture is being achieved on the eastern portion of the plume. The NDEP will not provide additional detailed comments at this time.

Response:

TRX has not, at this time, determined the best approach to quantify capture at the Interceptor Well Line in a definitive manner. TRX will continue exploring avenues, including some form of modeling that can better quantify the current capture scenario. As TRX reported in the September 14th meeting, we will contact the NDEP by E-mail to explain our proposed approach and seek NDEP review and comments.

TRX does believe that capture is being achieved on the eastern portion of the plume. Based on the May 2006 chromium data, wells I-K and M68, closest to TIMET well CLD2R, are lower in concentration than the TIMET well. In addition, well M74, immediately downgradient from the east edge of the slurry wall and TIMET well CLD2R, has continued to decline in chromium concentration since February 2005. The potentiometric map in this area suggests that any groundwater flowing around the slurry wall would move back to the northwest in the direction of M74. The declining chromium concentrations would tend to indicate that this is not happening.

NDEP Comment:

3. Potential Onsite Interim Remediation, page 6, it would seem that groundwater pumped from wells M-70, M-71 and M-72 could be treated with ferrous sulfate, calcium polysulfide or another suitable amendment relatively easily. Please discuss TRX's anticipated timeframe for evaluation of this interim remedial measure (IRM).

Response:

TRX agrees that the use of amendments, especially ferrous sulfate will successfully treat the chromium impact in the groundwater pumped from these wells. In fact, this is the preferred process that TRX envisions for these wells with the idea of dropping small pumps in each of the 2' diameter wells and pumping groundwater to the onsite chromium treatment system. However, the system is now working at a maximum and no additional groundwater can be sent for treatment. TRX does not plan to build a separate system to store and treat any groundwater potentially gathered from M70, -71, and -72. It is anticipated, rather, that cost-effective modifications, if viable, could be made to the current system to accommodate the additional flow. TRX does not currently have a timeframe for these potential modifications.

NDEP Comment:

4. Conclusions, page 8, the NDEP would like additional detail regarding the proposed timeframe to evaluate the implementation of additional measures to the west side of the chromium plume.

Response:

There appears to be some indication, based on perchlorate impact, that groundwater may be moving around the west boundary of the slurry wall. TRX has determined that an additional recovery well or wells to the west-southwest of well I-B would be the most likely method to halt movement of groundwater in this area. However, since the groundwater treatment system is currently at maximum capacity, TRX must come up with a different plan for the recovered groundwater. There is a possibility that the recovered groundwater from these proposed wells could be sent directly to GW-11 if the chromium concentrations are low enough. TRX is researching this possibility and will propose an alternative plan in the next semiannual report.

NDEP Comment:

5. Plate 2, the NDEP does not fully concur with the contours presented by TRX. In general, TRX lacks sufficient control to present contours as solid lines in several areas. Specifically, the NDEP does not concur that the 0.05 mg/liter contour between Athens Road and the Las Vegas Wash is discontinuous. Additionally, if a contour map was developed for hexavalent chromium the NDEP would be interested in additional contours at the 0.01 mg/liter and 0.005 mg/liter levels. Additionally, paleochannel locations may influence groundwater flow; however, they are not the only means of contaminant transport in the sub-surface. For example, it appears that the 0.05 mg/liter contour could be drawn between wells PC93/94, PC58, PC1, and PC2. It is unclear if this contour could be extended to the south to the vicinity of wells ARP-5, ARP-6 and further south.

Response:

TRX will endeavor to use dashed lines on future contour maps where analytical control is sparse, especially during sampling periods when a smaller grouping of wells is utilized. Dashed lines could also be used between Athens Road and Las Vegas Wash, especially between wells PC93/94, PC58, PC-1, and PC2. The potentiometric surface in the area of these wells could support this flow direction. However, the potentiometric surface map does not support a flow pathway between the PC1 – 2 area and ARP-5 and -6. Based on the groundwater flow regime, the source of the chromium in the PC-1 area apparently comes from the southeast. At this time, TRX has no plans to prepare a hexavalent chromium plume map. It is our belief that the most significant contributor of soluble chromium to the environment is hexavalent chromium, therefore the total chromium presentation will in effect represent the hexavalent chromium picture.

NDEP Comment:

6. Appendix E, the NDEP has the following comments:

Level of Data Validation. The memorandum states, "A limited review was performed on the data for the analyses of raw groundwater samples, raw surface waters, one equipment blank, and two field blanks for one or both of the parameters listed below:

- Hexavalent chromium by SW-846 Method 7196
- Total chromium by EPA 200.7

The NDEP letter, dated May 3, 2006, indicates data validation is to include 100% review and at least 10% validation to the raw data level. The details for each level of review are further specified in that letter. The level of review indicated in the memorandum does not meet the NDEP requirements.

Missing elements of the review include:

- Random check (10-20%) of Initial and Continuing Calibration.
- Random recalculation (10-20%) of reported results versus raw data.

If the level of laboratory reporting does not support a validation at Tier 2 this should be stated in the report.

Level of Reporting. The following items are missing in the Memorandum report. These items are required per the NDEP letter dated May 3, 2006. Many of these items can be addressed by including tables that contained the required information. Also, when accuracy, precision and holding time data is included, the table should also contain the applicable data quality indicator. Examples of data quality indicators include the percent recovery, RPD, time of collection to extraction and/or analysis.

- Applicable Samples, SDG ID, sample ID link to sample location, analyses.
- Data validation qualifier definition. When possible, the use of qualifiers be added to the tables, and used when appropriate, to identify a potential direction of a bias. For example, when the spike data show low recovery, and the associated samples and analytes are detected, a "J-" qualifier should be used to indicate an estimated, and potentially biased low, result. Similarly, a "J+" qualifier would be used for recoveries that are greater than the recovery criteria.
- Definitions for the reason codes that link results in the database to a specific qualifier logic.
- Data validation findings for each parameter based on the level of review. When non-conformances are identified they should be linked to the appropriate sample(s) and SDG.
- Evaluation of PARCCS parameters.
- Conclusions/Recommendations
- Electronic database of the dataset that is being addressed by the report including all raw data and laboratory report (on CD in Microsoft Access database).

It is recommended that TRX chemists discuss this matter with NDEP chemists before proceeding with any future data validation.

Response:

Regarding the level of data validation, MWH laboratory has not been providing full data packages for the routine monitoring at the Henderson site and this precludes performing the complete Tier 2 validation requested by NDEP. MWH has provided results, COC copies, a very limited narrative and batch QC results only for the routine monitoring reports. All the provided information was evaluated by the validators. An evaluation of all the reviewed elements is discussed in the data review memos.

Regarding the level of reporting in the data review memos, for future routine monitoring reports TRX will provide additional information including tabular summaries, qualifier definitions, reason codes and their definitions, an evaluation of the relevant PARCCS parameters, conclusions/recommendations, and an Access database table with all the relevant results, qualifiers, etc. as requested by NDEP. The content of this additional information will be limited by the data packages provided by the laboratory.

DRAFT

Meeting Minutes

Project: Tronox (TRX)
Location: NDEP – Las Vegas
Time and Date: 9:00 AM, September 14, 2006
Meeting Number: ---
In Attendance: NDEP-BCA – Brian Rakvica, Shannon Harbour, Todd Croft
Tronox – Keith Bailey, Susan Crowley, and Tom Reed (via phone)
ENSR – Dave Gerry (via phone) and Ed Krish

CC: Jim Najima

1. The meeting was held to discuss the consolidation and simplification of the reporting requirements for the perchlorate and chromium remedial systems.
2. Discussed the NDEP's June 13, 2006 letter to TRX which contained a number of comments and suggestions regarding the report format.
3. It was noted that TRX should include hard copies of figures and tables for select wells and include the remainder of the information on disk. Likewise, if it is more practical to only present ~5 quarters of data on a table and provide the remainder on disk, this is acceptable. TRX also noted that the disk will contain all parts of the database used in development of the report.
4. Discussed quarterly reporting and sampling.
 - a. TRX to develop a list of "key" wells to be sampled on a quarterly basis. TRX acknowledged that where possible the ECA sampling may supplant the performance monitoring sampling.
 - b. It was agreed that this reporting would only be for perchlorate. Chromium data may be collected but it would only be presented in the annual report.
5. Discussed annual reporting and sampling.
 - a. TRX proposed that this event would cover a much broader suite of wells.
 - b. TRX noted that the current annual report is delayed due to lack of data from outside parties. NDEP to follow up with outside parties.
 - c. TRX to develop a "monitoring plan" regarding the quarterly and annual sampling.
6. Discussed performance monitoring.
 - a. NDEP noted that to date performance mentoring has not been sufficiently definitive as to provide the NDEP with confidence in the capture efficiency. NDEP suggested that TRX explore other forms of modeling to demonstrate capture.
 - b. It was suggested that TRX develop an approach and provide it to the NDEP for review. TRX will develop an email that explains the approach. NDEP will review and provide comments or concurrence.
 - c. NDEP noted that the demonstration of capture will allow for the quarterly performance monitoring to be scaled back.
 - d. NDEP expects 95% capture to be demonstrated at the Athens Road Well Field (ARW).

- e. NDEP noted that a specified percent capture is not expected on-site, however, a more definitive understanding is necessary.
7. Discussed sampling methodologies.
- a. TRX noted that they believe that bailing mixed with traditional purge/sampling techniques should be acceptable for the performance monitoring data.
 - b. TRX is formulating this position as part of the upgradient report.
 - c. NDEP to review when submitted.
 - d. NDEP suggested that low-flow sampling may result in a time savings during sampling, depending on the depth of the well. NDEP also noted that dedicated low flow sampling devices are not necessary and that a portable unit could be used.
8. General and miscellaneous comments.
- a. Statements must be supported by the data.
 - b. TRX confirmed that they assume that all chromium in ground water is hexavalent. This will be clarified in future reporting.
 - c. TRX inquired if it would be okay to pump water from on-site into GW-11. NDEP does not see a problem with this.
 - d. Discussed historic data and data sharing. Noted that it will be necessary to somehow flag data in the data base in terms of available QC information and validation status.